

III. *Descriptions of new or little-known Genera and Species of Exotic Trichoptera; with Observations on certain Species described by Mr. F. WALKER.*  
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THE greater number of the exotic caddis-flies described in this paper were collected in the islands of the Malayan Archipelago by Mr. A. R. Wallace, and are contained in the collection of Mr. W. Wilson Saunders; others are in the British Museum or in my own collection. The paper may be considered as pretty well exhaustive of the new species existing in collections in this country, excepting a few of which there are only solitary and much damaged examples. I cannot but regret that in many instances the descriptions have of necessity been drawn up from single specimens. The number of new genera, compared with that of new species, is very considerable.

The more I become acquainted with the value of generic characters in the *Trichoptera*, the more am I convinced that, as in *Hymenoptera*, the neururation of the wings (combined with the leg-spurs and palpi) furnishes the safest starting-point for the formation of generic divisions. The wing system is not absolutely infallible, and is to a certain extent arbitrary, as indeed is the case with all schemes devised to facilitate the classification of natural objects, but it affords easily-seizable characters; care must, however, always be taken to avoid mistaking sexual for generic differences. In the family *Limnephilidæ* alone the wing-system appears to fail, the neururation of all the genera being almost identical; here too the palpi are of small value for generic diagnosis; and we are compelled to fall back upon the tibial spurs and other characters.

With respect to the abundance or paucity of tropical and southern *Trichoptera*, there are scarcely sufficient data to generalize upon. The number of known South American species is very small, yet Mr. Bates informs me that on the Amazons they were sometimes so abundant as to extinguish the lamps; in the

Malayan Archipelago, however, Mr. Wallace says that he only occasionally met with insects of this Order. The number of hitherto described extra-European species is about 260; of which 150 are from North America, and about 30 from Ceylon, leaving only 80 for the greater part of the Asiatic continent and islands, Australia, New Zealand, Africa and South America.

Fam. PHRYGANIDÆ.

Genus PHRYGANEÆ, Linn.

1. *Phryganeæ japonica*, n. sp.

*P. antennis nigricantibus, ad apicem ochraceis; capite dense griseo-piloso; mesothorace rufo-ochraceo, utrinque nigricante; alis anticis ad apicem sinuato-excisus, griseo-cinereis, griseo-reticulatis, vittis duabus vel tribus nigricantibus in cellulis apicalibus positus, punctoque ad thyridium albedo; posticis pallide aurantiacis, ad apicem late nigricante-fuscis; pedibus griseo-ochraceis; tarsorum articulorum apicibus, tibiis anticis et intermediis ad apicem, posticisque totis, externe fuscis; abdomine rufo-ochraceo. ♂ margine superiori segmenti ultimi longe rufo-aurantiaco fimbriato; appendicibus superioribus brevibus, subtriangularibus; intermediis rectis, aciculatis, testaceis; inferioribus subrotundatis, spina brevi incurvata instructis; lamina ventrali ad marginem late rotundata. (♂ et ♀.)*

Var. ♀. *Alis anticis vitta lata nigricante.*

Long. corp. 9—11 lin.; exp. alar. 26—32 lin.

Habitat in Japonia.

In Muss. Brit. et mihi.

Antennæ blackish, becoming ochraceous at the tips. Head thickly clothed with greyish pubescence. Palpi blackish. Mesothorax reddish-ocherous, blackish at the sides. Anterior wings with the apical margin sinuated and excised; yellowish cinereous, reticulated with grey, and with a short black streak in some of the apical cells; a whitish indistinct spot at the thyridium. Posterior wings pale orange, the apex broadly blackish-fuscous, in which portion the veins appear darker. Legs greyish-ochreous; the apices of the anterior and intermediate tibiæ and of the tarsal joints blackish-fuscous externally, as is the whole of the external side of the posterior tarsi; tibiæ with black spines. Abdomen reddish-ochreous. In the male the upper margin of the last abdominal segment is fringed with long reddish-

orange hairs; app. sup. short and subtriangular; app. intermed. very long, straight and needle-shaped, deep testaceous; app. inf. in the form of a rounded basal piece, whence proceeds a short, curved and acute spine; ventral lamina broadly rounded. In the female the inferior valves are elongated, subtriangular, and somewhat acute.

Variety of the female: a broad, blackish fuscous band runs through the middle of the anterior wings from the base to the apex, enclosing a conspicuous pale spot at the thyridium.

This beautiful species in form and structure agrees with the European *P. grandis*, excepting in the excised apical margin of the anterior wings. In coloration it bears a remarkable resemblance to *Colpomera sinensis* (Trans. Ent. Soc. 3rd ser. i. 302) from North China, but the latter species differs in its narrow and sub-falcate anterior wings and in the produced apex of the posterior. The discovery of *P. japonica* has convinced me that *Colpomera* can, at the utmost, be considered only as a section of *Phryganea*, because in *P. japonica* there is clearly to be seen an approach towards the alar formation of *Colpomera* in the excised apical margin of the anterior wing, and the similarity of coloration is so striking as to suggest the idea of the one being remotely descended from the other.

2. *Phryganea Maclachlani*, White (Pl. XVII. fig. 1, ♀).

*Holostomis Maclachlani*, White, Proc. Ent. Soc. 1861, p. 26.

*P. antennis nigris*, ♂ ad apicem brunneis; capite et thorace supra nigris, infra ochraceis; alis anticis rufo-aurantiacis, confertim nigricante-reticulatis, maculis duabus albidis, quarum una in cellula thyridii, altera in cellula apicali sexta; alis posticis purpureo-fuscis, fascia latissima subapicali aurantiaca; femoribus aurantiacis; tibiis, tarsis, abdomineque nigris. (♂ et ♀.)

Long. corp. 9—12 lin.; exp. alar. 30—34 lin.

Habitat in India orientali.

In Muss. Brit., Saundersiano, et mihi.

Antennæ black, brownish towards the apex in the male. Head and thorax dull black above, clothed with strong blackish hairs; beneath entirely reddish-ochreous. Palpi fuscous, the terminal joint darker. Anterior wings reddish-orange, thickly reticulated with blackish-fuscous; with two dull whitish spots, one in the

cellula thyridii, the other in the sixth apical cell. Posterior wings purplish-fuscous, a very broad orange-coloured band occupying almost the entire apical third; the extreme apex fuscous, with orange-coloured veins running through it. Legs with orange-coloured femora, and black tibiæ and tarsi. Abdomen dull blackish, the segments narrowly margined with greyish. In the male the superior appendices are very small and nearly concealed by the lateral margins of the last segment; app. inf. up-curved, triangular, acute and black; penis furnished with an enormously swollen testaceous apex.

This species was insufficiently characterized by Mr. Adam White; having recently received some remarkably fine specimens, I have drawn up the foregoing description. I have removed the species from the genus in which it was placed by Mr. White, because the neuration differs in the sexes, as in *Phryganea grandis* (that is to say, the female has an additional apical fork), whereas in *Holostomis phalænoïdes*, &c., the neuration is alike in both sexes. The antennæ are finer and shorter than in *P. grandis*, and the bright coloration of the wings contrasts strongly with our dull-looking species; the pubescence is also much less marked; the neuration, however, proves that it should be located in *Phryganea*.

#### Fam. LIMNEPHILIDÆ.

##### Genus LIMNEPHILUS, Leach.

##### 1. *Limnephilus (Glyphotælius) admorsus*, n. sp.

*L. magnitudine et facie omnino L. punctatolineati*; sed alarum anticarum margine apicali profundius exciso. (Appendicibus analibus defectis.) ♀.

Habitat in Japonia.

In Mus. Brit.

In size and coloration entirely similar to the European *L. punctatolineatus*, De Geer (*umbraculum*, Kolenati), but differs remarkably in the apex of the anterior wings, which is more produced in the costal portion, and afterwards much more deeply and irregularly excised; these wings have the two rows of dots or streaks precisely as in the European species. The single example is a female in good condition, excepting the apex of the abdomen, which has been destroyed, and hence I am unable to make a comparison of the anal appendices.

Fam. SERICOSTOMIDÆ.

Genus PYCNOCENTRIA, nov. gen.

Antennæ graciles, alis longitudine fere æquales; articulo basali robusto, hirsuto, quam capite longiori. Caput transverse-subquadratum, utrinque tuberculo elongato instructum. Palpi maxillares (♂) bisarticulati; articulo basali brevi, 2° elongato, robusto, sursum incurvato, pilis longioribus dense vestito; (♀) 5-articulati; articulo basali brevi; 2° elongato, robusto; 3° secundo æquali, crassiori; 4° et 5° æqualibus, brevioribus. Alæ anticæ apicem versus dilatatae; (♂) plica longitudinali apicem fere attingente et cellulam discoidalem obliterante; alæ posticæ antiis breviores, latitudine æquales, apice obtusæ, (♂) plica fere ut in anterioribus. Pedes hirsutiusculi. Calcaria 2-2-4; paribus duobus tibiaram posticarum juxtim positus. (♂ et ♀.)

Antennæ slender, about the length of the wings; basal joint thick and strong, nearly straight, longer than the head. Head transversely subquadrate; an oblique, elongated, oval tubercle on each side, placed close to the eye, and fringed with long hairs. Maxillary palpi of the male two-jointed; the basal joint very small and concealed; the second joint long and thick, curved up in front of the face between the basal joints of the antennæ, and furnished with long and strong hairs: of the female five-jointed; the basal joint short; the second long and stout; the third equal in length to the second, but much thinner; the fourth and fifth shorter and still thinner, nearly equal. Labial palpi small. Mesothorax smooth and polished, elevated in the middle. Anterior wings clothed with short and dense pubescence, dilated before the elliptical apex; in the male there is a longitudinal fold furnished with coarse hairs, extending nearly the whole length of the wing, and obliterating the discoidal cell, which is probably closed; the apical veins radiating. In the female this fold is absent, and there is a long and narrow, closed discoidal cell. Posterior wings shorter than the anterior, and scarcely so broad as the broadest portion of the latter; obtuse at the apex; in the male with a longitudinal fold extending obliquely from near the base to near the apex of the costal margin, obliterating the subcosta and radius; the discoidal cell closed; apical forks four. Legs moderately long and slightly hairy; spurs 2-2-4; anterior and intermediate tibiæ furnished each with a pair of moderately long and unequal apical

spurs; posterior tibiæ with two pairs of nearly equal spurs, the first pair placed close up to the apical. Abdomen short.

A well-marked and distinct genus of *Sericostomidæ*, with somewhat the *facies* of the European genus *Silo* of Curtis, to which it has some analogy in the presence of the longitudinal folds in the wings of the male, but in *Silo* it is only the posterior wings that are thus provided. The two pairs of spurs on the posterior tibiæ are placed closer together than in any other genus with which I am acquainted.

1. *Pycnocentria funerea*, n. sp. (Pl. XVIII. fig. 1.)

P. annis nigricante-fuscis; capite et thorace castaneis, nigricante-hirtis; alis anticis posticisque nigro-fuscis, plicis distincte saturatioribus, illis macula ad angulum analem albida; pedibus anticis griseo-ochraceis, intermediis et posticis fuscis, tibiis ochraceis; abdomine nigro-fusco; apice superiore lamina elongata, depressa, obtusa, appendices intermedias præter apices incurvatos celante, instructo; appendicibus inferioribus duplicibus, ramo superiore quam inferiore breviori et obtusiori; segmento antepenultimo ventrali (♀) lamina obtusa instructo. (♂ et ♀.)

Long. corp. 2 lin.; exp. alar. 6—6½ lin.

Habitat in Nova Zeelandia.

In Mus. Brit.

Antennæ blackish-fuscous. Head and thorax dark chestnut-brown, clothed with blackish hairs. Palpi thickly clothed with blackish hairs. Anterior and posterior wings dark smoky-fuscous, almost black, the folds in the male conspicuously darker; in the former there is a small whitish spot at the anal angle. Anterior legs wholly greyish-ochreous; intermediate and posterior legs with fuscous femora and tibiæ, and ochreous tarsi. Abdomen blackish-fuscous, the divisions of the segments paler. In the male the upper margin of the last abdominal segment is produced in the middle into a long flattened lobe, dilated at the base, but afterwards attenuated, and obtuse at the apex; from under this lobe project the curved points of the app. intermed.; app. sup. not apparent, perhaps concealed under the lobe; app. inf. double, consisting of two branches, the upper long, flattened, hairy and somewhat obtuse, the lower longer, and ending in an acute point; penis long and exerted, perhaps provided with upper and under sheaths. The female possesses a short obtuse lobe on the ventral surface of the antepenultimate segment.

Fam. LEPTOCERIDÆ.

Genus GANONEMA, nov. gen.

Antennæ longiores, tenuiores; articulo primo inflato. Caput fere quadratum, inter antennis productum. Ocelli nulli. Palpi maxillares hirsuti; articulo primo brevi; 2° quam 1° longiori; 3° quam 2° vix breviori; 4° quam 3° breviori; 5° tenui, 3° æquali. Alæ anticæ pube brevi sparse vestitæ, apicem versus valde dilatatæ; margine costali arcuato, apicali oblique rotundato; radio et sectore apicali primo confluentibus; cellula discoidali elongata, angustata, oclusa; alæ posticæ fere dimidio breviores; cellula discoidali aperta. Calcaria 2-4-4. Abdomen robustum. (♀.)

Antennæ very long and slender, more than twice the length of the wings; basal joint bulbous, scarcely so long as the head. Head nearly quadrate, produced into a broadly triangular prolongation between the antennæ, and with a deep excavation near the eyes, below the basal joints of the antennæ. Eyes large. Ocelli none. Maxillary palpi very hairy; the basal joint short; the second very long; the third slightly shorter than the second; the fourth much shorter than the third; the fifth about the length of the third, thinner and flexible. Prothorax scarcely evident. Mesothorax ovate, convex, sulcated in the middle above, scarcely hairy. Anterior wings rather broad, much dilated towards the apex; the hairy clothing slight, most dense along the costal margin; apical fringes very short; costa arched; apical margin obliquely rounded, nearly elliptical; dorsal margin concave; radius straight, confluent with the first apical sector shortly before its termination; discoidal cell long and narrow, closed, the apical half deeply excised on the upper margin from the point where the first apical sector branches off; first apical cell much longer than the succeeding ones; the inferior branch of the ramus discoidalis ending in three apical sectors; cellula thyridii long and narrow, closed by one transverse vein, and united to the lower edge of the discoidal cell by another. Posterior wings short, scarcely half the length of the anterior, broad, the costal margin slightly rounded; radius confluent with the first apical sector, as in the anterior wings; discoidal cell open; apical forks four. Legs very slender. Spurs 2-4-4; anterior tibiæ with a pair of minute apical spurs; intermediate and posterior tibiæ each with two pairs of rather long and unequal spurs. Abdomen robust.

The neuration of the male probably differs in the inferior branch

of the ramus discoidalis being simply furcate, and thus ending in only two apical sectors.

It seems to me probable that, notwithstanding the great dissimilarity in the shape of the anterior wings, the example from which I have drawn up this generic description may be only a female of the next genus (*Asotocerus*), and that the form of the wings may be only a specific character. The neuration presents many points of resemblance (excepting differences that are perhaps only sexual), and the form of the antennæ, head, palpi, &c., is identical. However the materials at my disposal are so slight, and the example on which I have founded *Asotocerus* is so much mutilated, that I think it best to place them in separate genera, rather than to run the risk of associating two forms which may in reality be distinct, especially as there are sufficient *primâ facie* reasons for separating them. Both genera are easily recognisable by the peculiar character in the neuration, viz., the termination of the radius in the first apical sector, and not, as is usual, in the costal margin.

1. *Ganonema pallicorne*, n. sp. (Pl. XIX. fig. 1.)

G. antennis albidis, basin versus indistincte griseo-annulatis; palpis griseo-fusco-hirsutis; capite mesothoraceque fuscis; alis fuligineo-fuscis, anticis margine costali nigricante, purpureo-iridescente, venis distinctis, nigricantibus; pedibus albidis. (♀.)

Long. antenn. 16 lin.; corp. 5 lin.; exp. alar. 17 lin.

Habitat in insula Sumatra (Wallace).

In Mus. Saundersiano.

Antennæ whitish, finely and indistinctly annulated with grey towards the base. Head and mesothorax fuscous. Palpi clothed with long greyish-fuscous pubescence. Anterior and posterior wings dark smoky-fuscous, entirely without markings; the costal margin, especially in the anterior wing, broadly blackish, with a purple reflexion in certain lights; neuration strong and distinct, blackish. Legs whitish. Abdomen greyish-fuscous. The last abdominal segment (♀) ends above in two large flat confluent triangular plates, the edges of which are hairy; beneath, these plates appear as a concave projecting cover.

GENUS ASOTOCERUS, nov. gen.

Antennæ graciliores, alis triplo longiores. Ocelli nulli. Palpi maxillares hirsutiores; articulo basali brevi; 2° longissimo;



3° quam 2° paulo breviori; 4° etiam breviori; 5° 3° æquali, tenuiori. Alæ anticæ sparse pilosæ; medio dilatatæ, basin versus angustæ; costa gradatim rotundata; margine apicali abrupte truncato et inde margine dorsali oblique juncto; radio ut in *Ganonema*; alæ posticæ anticis multo breviores, subtriangulares; cellula discoidali aperta. Pedes tenuiores. Calcaria 2-4-4. (♂ ?.)

Antennæ very long and slender, about three times the length of the wings; basal joint bulbous, not so long as the head. Head nearly quadrate, prolonged in front between the antennæ, and excavated below the basal joints of the latter. Eyes rather small. Ocelli none. Maxillary palpi very hairy; the basal joint short; the second very long; the third somewhat shorter; the fourth still shorter; the fifth as long as the third, thin and flexible. Mesothorax ovate, convex, sulcated in the middle above. Anterior wings with slight hairy clothing, which is thickest on the costal margin; narrow at the base, much dilated in the middle; costa gradually rounded; apical margin at first abruptly and straightly truncated, and then very obliquely uniting with the dorsal margin about the middle of the wing; or perhaps it should rather be said that the costal margin is abruptly bent down, forming a nearly right angle at the point of junction with the apical margin; dorsal margin nearly straight; neuration as in *Ganonema*, excepting that the two branches of the ramus discoidalis are simply furcate. Posterior wings much shorter than the anterior, subtriangular; discoidal cell open; fringes short, longer at the anal angle. Legs very slender. Spurs 2-4-4. (Abdomen wanting.)

It will be seen that *Asotocerus* agrees in almost all its characters with *Ganonema*; even the form of the wings may be only a specific difference. The character of the neuration, and the small size of the eyes, render it almost sure that the specimen from which the above generic description has been drawn up is a male, although the absence of the abdomen prevents absolute certainty on this point.

1. *Asotocerus ochraceus*, n. sp.

(Pl. XVII. fig. 2; Pl. XIX. fig. 2.)

A. antennis pallide ochraceis, nigro-annulatis; palpis griseo-ochraceis; capite mesothoraceque ochraceis; alis anticis pallide ochraceis, marginem costalem versus læte ochraceis;

alis posticis ochraceo-hyalinis, venis fuscis; pedibus ochraceis. (Mas?.)

Long. antenn. 20 lin.; corp. ?; exp. alar. 17 lin.

Habitat apud Sarawak, in insula Borneo (Wallace).

In Mus. Saundersiano.

Antennæ pale ochreous, all the articulations narrowly ringed with black. Head and thorax ochreous. Palpi greyish-ochreous. Anterior wings pale ochreous, the costal margin and the neuration bright ochreous. Posterior wings hyaline, thinly clothed with ochreous pubescence; neuration fuscous. Legs ochreous.

#### Genus NOTANATOLICA, nov. gen.

Antennæ graciliores, alis fere triplo longiores, in ♂ quam in ♀ longiores. Palpi maxillares hirsutiores; articulis 1° et 4° longis, fere æqualibus; 2°, 3° et 5° æqualibus et singulis 4° duplo longioribus. Alæ anticæ elongatæ, angustæ, sparse pilosæ; marginibus costali et dorsali fere parallelis; cellula discoidali oclusa; ramulo superiore rami thyriiferi ♂ furcato, ♀ bifurcato; alæ posticæ latæ, anterioribus breviores, subtriangulares. Pedes longi. Calcaria 2-2-2. Abdomen robustum, in ♀ subdepressum. Appendices inferiores in ♂ bisarticulatæ. (Mas et Fœm.)

Antennæ nearly thrice the length of the wings, longer in the male than in the female, very fine; basal joint swollen, scarcely so long as the head. Head transverse, hairy. Maxillary palpi very hairy; the first and fourth joints moderately long, nearly equal; the second, third and fifth equal, each about thrice the length of the fourth. Mesothorax long, the sides nearly parallel. Anterior wings very long and narrow, slightly hairy, most so in the female; costal and dorsal margins nearly parallel, the apex slightly dilated and elliptical; neuration strong; discoidal cell closed, dilated and angular at the apical end; in the female there is one more apical cell than in the male, owing to the upper branch of the superior branch of the ramus thyriifer being twice forked in that sex, and only simply forked in the male; the radius is united to the discoidal cell by a transverse vein; another transverse vein unites the discoidal cell to the cellula thyridii; and there are three others placed nearly in a straight line below it, one of them closing the cell. Posterior wings broad, subtriangular, shorter than the anterior; neuration alike in both sexes;

discoidal cell closed; apical forks four, the first very small. Legs long. Spurs 2-2-2, each tibia being provided with two small and equal apical spurs. Abdomen robust, depressed in the female; anal appendices well developed in the male, the inferior pair bisarticulate; in the female the apex of the abdomen is obtuse, with two rounded superior valves.

A genus with the *facies* of *Leptocerus*, and formed to receive the species described as *Leptocerus magnus*, Walker, *L. oppositus*, Walker, *L. canescens*, M'Lachlan, &c., together with some hitherto-undescribed species, which do not agree with *Leptocerus* in the neururation. The group appears to be peculiar to Australia, New Zealand, and the neighbouring islands of the Eastern Archipelago.

I am now inclined to consider my *L. canescens* as merely the female of *L. magnus*. I have received numerous examples from Mr. Edwards of Melbourne, and in all cases the specimens of the one are males, and of the other females. *L. oppositus* and *L. cognatus* are also nearly related to these, and may be only varieties, but the difference of locality favours the suspicion that they are distinct. *L. cephalotes*, Walker, from New Zealand, probably also belongs to this genus, but the type is scarcely recognisable, and *L. exiguus*, M'Lachlan, should, perhaps, be added, but I await the opportunity of further investigation.

The species will therefore stand as follows:—

1. *Notanatomica magna*, Walker. (Pl. XIX. fig. 3.)

*Leptocerus magnus*, Walk., Brit. Mus. Cat. Neurop., pt. I, p. 73, 69, ♂; *L. canescens*, M'Lach., Trans. Ent. Soc., 3rd series, i. 306, ♀.

I subjoin a description of the anal appendices. In the male there is a broad rounded lobe from the middle of the upper margin of the last abdominal segment; on each side of this are placed the app. sup., which are small, elongated, obtuse, yellow, and furnished with long hairs at the apex; app. inf. bisarticulate, the first joint broad and obliquely truncated at the apex, the second joint double, the upper portion long and curved, the lower portion shorter; at the base of the app. inf. there is an additional appendage, curved upwards, and fringed with long and strong hairs; interiorly is to be seen a boat-shaped upper penis-cover including the small penis. The female is furnished with a broad rounded lobe, and two small obtuse superior valves.

2. *Notanatomica opposita*, Walker.

*Leptocercus oppositus*, Walk., *op. cit.*, p. 73, 68.

3. *Notanatomica cognata*, M'Lachlan.

*Leptocercus cognatus*, M'Lach. *loc. cit.* ♀.

4. *Notanatomica (?) cephalotes*, Walker.

*Leptocercus cephalotes*, Walk., *op. cit.* p. 73, 67.

5. *Notanatomica gilolensis*, n. sp.

N. antennis pallide albido-griseis, basin versus indistincte pallide annulatis; capite et thorace fuscis; palpis saturate fuscis, griseo-pilosis; alis anticis griseo-brunneis, griseo- et brunneo-pilosis; posticis fuligineo-fuscis, venis fuscis; pedibus pallide griseo-brunneis; abdomine fusco, lineis utrinque ochraceis. (Fœm.)

Long. antenn. 22 lin.; corp. 4½ lin.; exp. alar. 16 lin.

Habitat in insula Gilolo (Wallace).

In Mus. Saundersiano.

Antennæ pale whitish-grey, with very indistinct paler annulations towards the base; the basal joint fuscous. Head and thorax fuscous. Palpi dark fuscous, clothed with grey hairs. Anterior wings greyish-brown, with grey and brown pubescence intermixed; a whitish spot at the thyridium. Posterior wings smoky-grey, subhyaline; the neuration dark fuscous. Legs pale greyish-brown. Abdomen dark fuscous, with broad greyish-ochreous lateral lines. In the female the superior valves are somewhat elongated and obtuse.

In Mr. Saunders' Collection is a male from New Guinea, which I think belongs to this species, but it is smaller than the female described above (exp. alar. 14 lin.), whereas in *N. magna* the female is considerably smaller than the male. It differs in the antennæ being dark brown, with distinct white annulations (in *N. magna* the coloration of the antennæ differs in the sexes) and in the darker colour of the legs. The anal appendices are not in a condition to be satisfactorily described, but they appear to be arranged similarly to those of *N. magna*.

## GENUS SETODES, Rambur.

The limits of this genus are at present ill-defined. The species included in it by Rambur are discordant, and he places some spe-

cies in his genus *Mystacida* which should more properly belong to this. In my "*Trichoptera Britannica*" (*ante*, p. 116) I have shown that *Setodes* may be divided into two sections according to the neuration, and this seems to me the best character. The species vary in the length of the joints of the palpi, and also in the spurs of the anterior tibiæ; this latter variation is of grave importance in this Order, in consequence of the character being considered of primary value. Rambur describes the anterior tibiæ as spurless, and this is apparently the case in some European species, but I do not feel sure that this is really so, because I can detect two very minute and almost microscopic apical spurs on those tibiæ in some species; in others there is evidently one rather long apical spur, with no visible sign of a second.

1. *Setodes hemerobioides*, n. sp.

S. antennarum articulo basali, capite, thorace, pedibusque griseo-albis; alis nudis, latis, ad apicem obtusis, hyalinis; anticis fusco-nebulosis, præcipue ad basin marginis costalis; venis nigro-fusco striatis; ramulo superiore rami thyriferi haud furcato; alis posticis hyalinis; pedibus albidis; tibiis anticis unicalcaratis; abdomine viridescente; appendicibus inferioribus longis, sursum incurvatis. (Mas.)

Long. corp.  $2\frac{1}{2}$  lin.; exp. alar. 7 lin.

Habitat ad Macassar, in insula Celebes (Wallace).

In Mus. Saundersiano.

Antennæ (broken) with the basal joint whitish. Head naked, whitish, with grey streaks and a black mark externally at the insertion of the basal joint of each antenna. Eyes whitish-ochreous. Maxillary palpi whitish, the three first joints very long, the second fuscous at the apex. Mesothorax greyish-white. Anterior wings devoid of hairy clothing, broad, the apex obtuse; whitish-hyaline, with greyish-fuscous clouds, of which there is a large one placed at the base of the costal margin, which is dilated; another is placed about the middle of this margin, and smaller ones round the apex and about the anastomosis; neuration scarcely darker than the membrane, but marked with blackish-fuscous streaks at the base, apex and anastomosis; the upper branch of the ramus thyrifer is not forked; the three transverse veins, forming the anastomosis, are straight, the first and third nearly opposite, the second placed a little within the others towards the base. Posterior wings hyaline, the veins slightly coloured. Legs

whitish : the anterior tibiæ furnished with one rather long apical spur. Abdomen greenish. In the male the superior appendices appear to be wanting, but there are two rounded lobes, from between which arises a curved and pointed spine ; inferior appendices long, curved upwards, a little concave internally.

The single specimen is mutilated, having lost its antennæ, excepting the basal joints. In its broad, hyaline and naked anterior wings it bears a not remote resemblance to a species of *Hemero-bius* ; hence the specific name.

NOTE. *Setodes scapunctata*, Kolenati, from India (Gen. et Spec. Trichop. pt. 2, p. 266, 3, tab. 3, fig. 28), cannot possibly pertain to *Setodes*, or even to an allied genus. According to the neuration of the figure, it should probably form a new genus. The arrangement of the nervures in the posterior wings is not unlike that of *Polymorphanisus*, Walker, but the veins of the anterior wings are too different, supposing the figure to be correct.

#### Genus ANISOCENTROPUS, M'Lachlan.

Trans. Ent. Soc. 3rd series, i. 492.

##### 1. *Anisocentropus flavicaput*, n. sp.

A. antennis fuscis, dimidio basali flavido-annulatis, articulo basali flavido-ochraceo ; capite et palpis flavido-ochraceis, his articulo ultimo fusco-terminato ; thorace supra et infra rufo-ochraceo ; alis anticis et posticis totis fuscis, his pallidioribus, venis saturatoribus ; pedibus ochraceis, tibiis et tarsis posterioribus fuscescentibus, fusco-pilosis ; abdomine intense fusco. (♂.)

Long. antenn. 7 lin. ; corp. 3 lin. ; exp. alar. 9 lin.

Habitat in Australia boreali (Damel).

In Mus. mihi.

Antennæ dark blackish-fuscous, annulated with yellowish on the basal half ; basal joint bright yellowish-ochreous. Head and palpi bright yellowish-ochreous, the terminal joint of the latter tipped with fuscous. Eyes black. Thorax reddish-ochreous both above and below. Anterior and posterior wings uniformly fuscous ; the latter paler, subhyaline, and with dark fuscous veins. Legs bright ochreous ; the posterior tibiæ and tarsi fuscescent, with fuscous hairs. Abdomen dark blackish-fuscous, ochreous at the apex, and with ochreous appendices.

A well marked species of *Anisocentropus* ; the anterior wings possess a rather strong pubescence, and in this respect it bears

more resemblance to the North-American, than to the Eastern representatives of the genus.

The British Museum possesses yet two species, which agree with *Anisocentropus* in the neuration, tibial spurs, and general appearance, but differ somewhat in the maxillary palpi; these have the terminal joint strongly fringed with long hairs, and several of the joints have the appearance of being somewhat dilated; but the differences seem scarcely sufficient to warrant their generic separation. The single example of each species is not in sufficiently good condition to enable me to draw up a satisfactory description. They are from the Philippine Islands and New Guinea respectively.

Fam. HYDROPSYCHIDÆ.

Genus MACRONEMA, Pictet.

1. *Macronema Saundersii*, n. sp.

(Pl. XVII. fig. 3, ♂; Pl. XIX. fig. 4.)

M. *antennis fuscis, articulo basali et spatio longo in medio flavis; capite purpureo-fusco, linea mediana flava; palpis flavis; mesothorace purpureo-fusco; alis nitente-fuscis, albosignatis, anticis vittis tribus, duabus basalibus, una apicali, et maculis triangularibus magnis, tribus ad costam, una ad marginem dorsalem; alis posticis maculis costalibus albis; pedibus flavis, tibiis extrorsum obscurioribus; abdomine flavo; appendicibus superioribus rectis, angustis, acutis; inferioribus longis, sursum incurvatis; pene ad apicem inciso. (♂.)*

Long. antenn. 11 lin.; corp. 4 lin.; exp. alar. 11 lin.

Habitat in insula Mysol (Wallace).

In Mus. Saundersiano.

Antennæ fuscous, the basal joint and a long space in the middle yellow. Head purplish-fuscous, with an impressed yellow line in the middle. Palpi yellow, somewhat fuscous. Mesothorax purplish-fuscous. Anterior wings shining fuscous; three large triangular spots on the costa and one on the dorsal margin, white; two white basal vittæ, the upper one short, the lower one longer and uniting with the dorsal spot; in the apex a white vitta, the basal end of which is slightly produced downwards; neuration dark fuscous. Posterior wings shining fuscous, with three large white costal spots. Legs yellowish, the tibiæ some-

what fuscous externally. Abdomen yellow. The superior appendices form two broad and divergent blades; inferior appendices very long, the joints nearly equal, the first straight, dilated towards the apex, the second curved and also dilated towards the obtuse apex; penis broad and obtuse, the apex slightly notched.

A very pretty and distinct species, belonging to the group of *M. hyalinum*, &c., in the character of its coloration.

2. *Macronema Wallacei*, n. sp. (Pl. XVII. fig. 4, ♀.)

*M.* antennis fuscis, ad basim flavo-ochraceis; capite, palpis, mesothorace, pedibus, abdomineque flavo-ochraceis; alis fuscis, nitidis; anticis ad basim flavo-albido striatis et maculis magnis in medio albidis; posticis macula costali magna albida. (♀.)

Long. antenn. 11 lin.; corp.  $4\frac{1}{2}$  lin.; exp. alar.  $11\frac{1}{2}$  lin.

Habitat in Nova Guinea (Wallace).

In Mus. Saundersiano.

Antennæ fuscous, yellowish-ochreous at the base. The whole of the body, palpi and legs yellowish-ochreous. Eyes blackish. Anterior wings shining fuscous; at the base there are several yellowish-white longitudinal lines, which are confluent and form one large pale space at the extreme base; in the middle of the wing are two very large white opposite blotches, one on the costa, the other on the dorsal margin, each produced towards the apex; these blotches form a nearly entire broad band across the wing, being separated by a very narrow line of the dark ground colour; the veins traversing them are yellowish; neuration (except in the pale spaces) dark fuscous. Posterior wings shining fuscous, with a large white blotch on the middle of the costal margin reaching more than half across the wing.

3. *Macronema dulce*, n. sp.

*M.* antennis flavis, basim versus vix fusco-annulatis, articulo primo fuscescente; capite saturate fusco, maculis tribus in fronte flavis; prothorace flavo-fusco; mesothorace antice nigro, postice castaneo; palpis et pedibus flavis; alis pallide fuscis, aurantiaco-iridescentibus, anticis vittis brevibus ad basim albis, et fascia lata media, fere interrupta, alba; posticis spatio longo costali albo; abdomine ochraceo. (♀.)

Long. antenn. 10 lin.; corp.  $3\frac{1}{2}$  lin.; exp. alar. 9 lin.

Habitat in insula Mysol (Wallace).

In Mus. Saundersiano.



Antennæ yellow, finely annulated with fuscous at the divisions of the joints towards the base; basal joint fuscous externally. Head rich dark brown, with three yellow spots in front. Palpi yellow. Prothorax fuscous, somewhat ochraceous. Mesothorax black in front, chestnut brown behind. Anterior wings pale fuscous, with a brilliant golden reflexion; two short whitish lines at the base, one along the costa, the other in the middle; a broad white fascia in the middle, nearly interrupted on the apical side by a narrow prolongation of the dark ground colour. Posterior wings similar in colour to the anterior; a long white space along the costal margin; neuration in all the wings fuscous, except in the pale spots, where it is yellow. Legs yellow. Abdomen dull ochreous.

This species somewhat resembles the last, but may be instantly separated by the coloration of the body.

The genus *Macronema*, as it now stands, may be at once recognized by the remarkably small discoidal cell of the anterior wings; the neuration does not seem to offer any important variation in the numerous species, but I am convinced that much remains to be done in the way of subdividing the genus according to the number or form of the spurs on the anterior tibiæ. This has been partially done by Kolenati (Gen. et Spec. Trichop. pt. 2, p. 239), who forms the genus *Macrostemum* of a section which he says is characterized by the absence of anterior tibial spurs. I have lately examined about twenty-seven species with a view to ascertain if these could be arranged in any well-defined limits, but the results are unsatisfactory, owing to their having been, for the most part, obtained from single individuals of each species, in some of which the spurs may have been accidentally broken. Moreover, I am sure that in some species the anterior spurs vary in the sexes; as examples of this I will cite *M. capensis*, Walker, and *M. fastosa*, Walker. Again, some possess two long and equal spurs on these tibiæ, and others two very unequal spurs; in some there appears to be only one spur, and I think that others will surely bear out Kolenati when he denies the existence of any anterior spurs; yet appearances are sometimes deceptive, for on examining three examples of *M. apicalis*, Walker, two of them certainly appeared to have spurless anterior tibiæ, whilst a third exhibited two very minute spurs.

The following notes on the synonymy of this genus may be useful:—

*M. albovirens*, Walker, and *M. agraphum*, Kolenati. Both

these species are referred to *Leptonema pallida* of Guérin, by Dr. Hagen in his "Synopsis Synonymica." I have examined individuals that appear to pertain to the one and the other respectively, and I am inclined to think that *M. albovirens* is a good and distinct species, but that *M. agraphum* is identical with *L. pallida*. *M. albovirens*, of which I have seen several examples, may be distinguished by the green colour of the veins and the perfectly colourless membrane of the wings; in *M. agraphum* (*L. pallida*) the veins are somewhat testaceous and the membrane distinctly coloured in the areas mentioned by Kolenati.

*M. signata*, Walker, *M. inscripta*, Walker, and *M. pulcherrima*, Walker, all from Sierra Leone, are possibly only varieties of one species; the two last, I think, are certainly identical.

*Hydropsyche multifaria*, Walker, has already been justly transferred to *Macronema* by Dr. Hagen.

*H. vicaria*, Walker, is also placed in *Macronema* and perhaps justly, but the dense hairy clothing of the wings renders an examination of the neuration difficult without injuring the type.

*Hydropsyche transversa*, Walker, is certainly a *Macronema*, but of a peculiar *facies*.

*Leptocerus niveistigma*, Walker, *L. abjurans*, Walker, and *L. quadrifurca*, Walker (Trans. Ent. Soc. 2nd ser. vol. 5, pp. 176, 177), must form a section of *Macronema*. See the observations at the end of this paper.

#### Genus STENOPSYCHE, nov. gen.

Antennæ graciles, alis longiores, intus inconspicue serratæ. Caput subquadratum, postice dilatatum, pilosum. Ocelli magni. Palpi maxillares articulis duobus basalibus brevibus, 3<sup>o</sup> longissimo; 4<sup>o</sup> vix 2<sup>do</sup> longiori; 5<sup>o</sup> præcedentibus in unum æquali. Alæ anticæ elongatæ, angustæ, lanceolatæ, ad apicem acutæ, sparse pilosæ; cellula discoidali parva, oclusa; furcis apicalibus 1<sup>a</sup>, 2<sup>a</sup>, 3<sup>a</sup>, 4<sup>a</sup> et 5<sup>a</sup> instructæ; posticæ valde breviores, opacæ, furcis apicalibus 3<sup>a</sup> et 5<sup>a</sup> instructæ. Pedes modice longi. Calcaria 3-4-4. (♂.)

Antennæ longer than the wings, fine, indistinctly serrated within, the basal joint short. Head subquadrate, widened posteriorly, hairy. Eyes very large, subglobose. Ocelli large and distinct, oval. Maxillary palpi slightly hairy; the first and second joints short; the third very long; the fourth rather longer than the second; the fifth about the length of the others united. Labial

palpi small; the first and second joints short, the latter the longer; the third equal in length to the others united. Mesothorax large, hairy, somewhat truncated in front. Anterior wings long and narrow, the apical portion slightly dilated, the apex rather acute; hairy clothing slight; discoidal cell small, closed; cellula thyridii long; apical forks 1, 2, 3, 4 and 5 all present.\* Posterior wings much shorter than the anterior, and more than twice as broad, opaque; costal margin arched; apex obtuse; anal portion largely developed; discoidal cell small, closed; apical neuration irregular; forks 3 and 5 present; a transverse vein below the discoidal cell, another below the first and more towards the apex, and a long curved one from the base of fork 5 to the first of the costulae. Legs moderately long and slender. Spurs 3-4-4; anterior tibiae with two short and nearly-equal apical spurs, and one short median; intermediate and posterior tibiae each with two long median and apical spurs, the inner spur of each pair being the longer. Abdomen long and moderately robust; anal appendices well developed and complicated.

*Stenopsyche* differs widely from any described genus of *Hydropsychidæ*. The combined characters of the long and narrow wings, the neuration, and the tricalcarate anterior tibiae, will enable it to be readily recognized. At present I know of only one species, and of that only the male sex. It is probable, judging from analogy, that the female may possess dilated intermediate legs.

1. *Stenopsyche griseipennis*, n. sp. (Pl. XVII. fig. 5.)

S. antenn. grisescentibus, ad basim indistincte annulatis; capite et thorace brunneis, griseo-pilosis; oculis intense brunneis; ocellis flavis; alis anticis pallidè griseis, confertim griseofusco reticulatis et maculatis; posticis totis sordide albidis; pedibus testaceis, tibiis anterioribus et intermediis late fuscoannulatis; abdomine brunneo. (♂.)

Long. antenn. 14 lin.; corp. 7 lin.; exp. alar. 20 lin.

Habitat in India orientali.

In Mus. mihi.

Antennæ greyish, darker towards the apex, the basal portion with indistinct darker annulations. Head and thorax brown, with grey pubescence. Palpi brown. Eyes dark brown. Ocelli bright yellow. Anterior wings pale grey, thickly reticulated and

\* The numbering of the apical forks in the neuration of the wings of the *Hydropsychidæ* is fully explained, *ante*, p. 123.

blotched with dark greyish-fuscous; the blotches are largest towards the base and on the apex; costal margin with numerous short transverse streaks. Posterior wings uniformly dull whitish, opaque, the veins scarcely darker. Legs pale testaceous; the anterior and intermediate tibiæ and tarsi broadly annulated with fuscous. Abdomen brownish-testaceous. In the male a broad elongated lobe proceeds from the middle of the upper margin of the last abdominal segment, and is truncated and notched at its apex; on each side of this lobe proceed the long, filiform, hairy and slightly-curved superior appendices, and from beneath on each side arises a fine cylindrical intermediate appendage, curved strongly outwards at the tip; app. inf. broad and triangular at the base, but ending in an elongated point; immediately below the app. inf. are seen two thickened straight pieces, which I regard as the lower penis-sheaths; the penis is not apparent in my example.

The coloration of the anterior wings somewhat resembles that of a faded example of *Phryganca varia*.

#### Genus LEPTOPSYCHE, nov. gen.

Antennæ graciliores, alis triplo longiores; articulo basali inflato.

Ocelli nulli. Palpi maxillares longi; articulo basali brevissimo; 2° longiore, gracili; 3° et 4° brevibus, crassioribus, fere æqualibus; 5° gracillimo, præcedentibus in unum æquali. Alæ fere nudæ; anticæ elongatæ, angustæ, ad apicem rotundatæ; venula transversa obliqua medium versus inter costam et subcostam; cellula discoidali aperta; furcis apicalibus 1<sup>a</sup>, 2<sup>a</sup>, 3<sup>a</sup>, 4<sup>a</sup> et 5<sup>a</sup> instructæ; posticæ latæ, breves, margine costali exciso; furcis apicalibus 2<sup>a</sup>, 3<sup>a</sup> et 5<sup>a</sup> instructæ. Pedes graciles. Calcaria 2-4-4. Abdomen breve. Appendices inferiores longæ, graciliores. (Mas.)

Antennæ very slender, about three times the length of the wings; basal joint bulbous, scarcely so long as the head. Head transversely subquadrate above, with a small tubercle between the basal joints of the antennæ; sides prominent, obliquely truncated. Eyes small. Ocelli none. Maxillary palpi long and slender, slightly hairy; basal joint very short; second long and slender; third and fourth each about half the length of the second and stouter; fifth very slender, thong-shaped, as long as, or longer than, all the others united. Labial palpi small, the terminal joint long. Prothorax forming a narrow collar. Mesothorax obovate, with a rounded tubercle at each shoulder. Anterior

wings shining, with very short and slight pubescence, narrow, the apex elliptical; neuration fine; two oblique transverse veins uniting the costa and subcosta, one before the middle of the costa, and another near the termination of the subcosta; discoidal cell open; cellula thyridii small, closed by a transverse vein; another transverse vein at the base of this cell, and yet another below it towards the base of the wing; apical forks 1, 2, 3, 4 and 5 all present, fork 5 rudimentary. Posterior wings much shorter and broader than the anterior; anal portion well developed; costal margin excised before the apex; no discoidal cell; apical forks 2, 3 and 5 present, fork 3 very small. Legs slender. Spurs 2-4-4; anterior tibiæ with two minute apical spurs; intermediate with two pairs of long and very unequal apical spurs; posterior tibiæ with two pairs of long and nearly equal spurs. Abdomen short and stout; inferior appendices long and slender.

There is not any described genus of *Hydropsychidæ* which approaches this, either in general form, or in the arrangement of the nervures; the open discoidal cell of the anterior wings is peculiar, as it is generally closed in this family.

1. *Leptopsyche gracilis*, n. sp.\* (Pl. XIX. fig. 8.)

L. antennis fusco-ochraceis, ad basim ochraceis; capite, palpis thoraceque ochraceis; oculis nigris; alis anticis nitente-flavis; posticis flavo-hyalinis, iridescentibus, venis flavo-ochraceis; pedibus flavo-albidis, tarsis ochraceis; abdomine ochraceo; appendicibus superioribus parvis, quadratis; inferioribus longis, gracilibus, sursum incurvatis, forsitan bisarticulatis. (♂.)

Long. antenn. 19 lin.; corp. 4 lin.; exp. alar. 13 lin.

Habitat in insula Dorey (Wallace).

In Mus. Saundersiano.

Antennæ ochraceous, somewhat fuscous, at the base wholly ochraceous. Head, palpi and thorax ochreous. Anterior wings shining, semi-transparent, yellow, the apex slightly brownish-ochreous. Posterior wings hyaline, tinged with yellowish, beautifully iridescent; neuration yellowish-ochreous. Legs pale yellowish; all the tarsi ochreous. Abdomen ochreous; superior appendices very small, quadrate; inferior appendices long and slender, curved upwards and approximating at the tips, apparently bisarticulate, but the first joint is short and nearly concealed; penis thick.

## Genus NESOPSYCHE, nov. gen.

Antennæ graciles (alis longiores?), articulo basali brevissimo. Caput planum, fronte magna. Ocelli nulli. Palpi maxillares articulo basali brevi; 2° et 3° fere æqualibus, dilatatis; 4° tenui, brevi; 5° gracili, 3° æquali. Palpi labiales articulo basali brevi; 2° longissimo, incurvato, subtus fimbriato; 3° gracili. Alæ anticæ ad basin angustæ, apicem versus dilatatæ, apice obliquo, pilis brevibus vestitæ; cellula discoidali occlusa; furcis apicalibus 1<sup>a</sup>, 2<sup>a</sup>, 3<sup>a</sup>, 4<sup>a</sup> et 5<sup>a</sup> instructæ; posticæ breves, fere latæ; cellula discoidali occlusa; furcis apicalibus 2<sup>a</sup> et 5<sup>a</sup> instructæ. Pedes modice longi; tibiis intermediis (♀) haud dilatatis. Calcaria 3-4-3; calcaribus apicalibus tibiarum posticarum valde inæqualibus, uno modice elongato, incurvato, altero longissimo, robusto, torquato. (Fœm.)

Antennæ slender, probably longer than the wings (broken); the basal joint very short, scarcely thicker than the following. Head smooth, subquadrate above, the front large and convex. Ocelli none. Maxillary palpi with the basal joint short; the second and third joints nearly equal, broad and dilated, obliquely truncated at the apex; the fourth shorter and much thinner than the third; the fifth still thinner, not longer than the third. Labial palpi with the basal joint short and small; the second very long, curved, furnished beneath with a short and thick fringe of hairs; the third slender, not longer than the second. Prothorax well developed. Mesothorax smooth, convex, obovate. Anterior wings narrow at the base, dilated towards the very oblique apex; hairy clothing very slight; discoidal cell short and broad, closed; a transverse vein unites the discoidal cell to the radius; there are two others below this cell, and two placed towards the base of the wing; forks 1, 2, 3, 4 and 5 all present, fork 1 very small. Posterior wings much shorter than the anterior, and slightly broader, rounded at the apex; discoidal cell closed; forks 2 and 5 present. Legs moderately long; the intermediate tibiæ and tarsi not dilated in the female. Spurs 3-4-3; anterior tibiæ with two moderately long and equal apical spurs, and one short spur placed near the base; intermediate tibiæ with two pairs of long spurs; posterior tibiæ with one short median spur, placed nearer the apex than is usual, and two very unequal apical spurs, the outer moderately long and of the ordinary form, the inner very long, nearly

reaching the apex of the first tarsal joint, and much bent in a somewhat spiral manner. Abdomen slender.

I know of no genus approaching this in the peculiar structure of the labial palpi, or in the extraordinary form and arrangement of the tibial spurs; on the posterior tibiæ, I cannot detect any sign of a second median spur, and the form of the inner apical one is very singular.

1. *Nesopsyche flavisignata*, n. sp.

(Pl. XVII. fig. 6; Pl. XIX. fig. 6.)

N. antennis nigro-fuscis; capite nigro, inter antennis flavo; palpis maxillaribus, mesothorace, abdomineque nigris; palpis labialibus flavis; alis anticis saturate fuscis, maculis magnis flavis et macula subocellata ad apicem albida; posticis fuscis, ad apicem albido-nebulosis; pedibus fuscis, testaceo-variis; tarsis omnibus testaceo-ochraceis. (♀.)

Long. antenn. ?; corp.  $4\frac{1}{2}$  lin.; exp. alar. 11 lin.

Habitat ad Macassar, in insula Celebes (Wallace).

In Mus. Saundersiano.

Antennæ blackish-fuscous, the basal joint yellow. Head black, yellow between the antennæ. Maxillary palpi black. Labial palpi yellow. Mesothorax and abdomen black. Anterior wings dark fuscous, with large yellow spots, of which a triangular one on the dorsal margin, with a prolongation towards the base, is the most conspicuous; in the apex there is a large, almost circular, whitish spot, enclosing a large pupil of the ground colour. Posterior wings fuscous, slightly and narrowly yellowish about the middle of the costal margin, and with an indistinct whitish cloud in the apex. Legs with all the coxæ blackish-fuscous; anterior femora testaceous at the tips; intermediate and posterior femora testaceous, fuscous at the base; posterior tibiæ wholly fuscous; all the tarsi testaceous.

Genus HYDROPSYCHE, Pictet.

1. *Hydropsyche Edwardsii*, n. sp. (Pl. XVII. fig. 7.)

H. antennis albido-ochraceis, apicem versus fuscis, articulorum apicibus fusco-annulatis; capite et thorace fuscis, albo-pilosis; palpis griseo-fuscis; alis anticis albis, margine costali griseo, stria obliqua subapicali intense grisea; posticis

margaritaceis, longe albo-fimbriatis ; pedibus griseo-ochraceis, tibiis et tarsis posterioribus albis, albo-pilosis ; abdomine griseo-albo, infra obscuriori ; appendicibus inferioribus bisarticulatis, articulo primo brevi, 2<sup>o</sup> longo, pallide viridi-albis ; pene ad apicem testaceo, sub apicem haud tuberculato. (Mas.)

Long. corp. 3 lin. ; exp. alar. 8 lin.

Habitat ad Melbourne in Australia (Edwards).

In Mus. mihi.

Antennæ whitish-ochreous, fuscous towards the apex, and with the tips of the joints annulated with fuscous. Head and thorax fuscous, clothed with white pubescence. Palpi greyish-fuscous. Anterior wings white, the costal margin greyish, and with a dark-grey oblique transverse streak, extending from near the apex of the costal margin half-across the wing ; apical cilia greyish. Posterior wings pure pearly-white, without any trace of darker markings, and furnished with long white cilia. Legs greyish-ochreous, the posterior tibiæ and tarsi white, with long white hairs. Abdomen greyish-white, darker beneath. In the male the inferior appendices are long and forcipated, the first joint very short, the second extremely long, pale greenish-white ; penis testaceous at the apex, without any apparent subapical projection.

An extremely delicate species, agreeing in all its most important characters with the European representatives of the genus, but differing in certain minor respects ; the posterior wings being broader, with the apical portion more strongly developed, the cilia longer, and the posterior legs more hairy. The second joint of the inferior appendices is usually small in European forms, the first being the longer.

#### Genus *Sciops*, nov. gen.

Antennæ alis longiores. intus obsolete serratæ. Caput quadratum, supra politum. Ocelli nulli. Palpi maxillares hirsuti ; articulo primo brevissimo ; 2<sup>o</sup> longiori ; 3<sup>o</sup> vel 2<sup>o</sup> longiori ; 4<sup>o</sup> 2<sup>o</sup> æquali ; 5<sup>o</sup> tenuiori, præcedentibus in unum æquali. Alæ fere glabræ, latæ ; anticæ apicem versus dilatatæ, sub apicem vix excisæ, sed apice oblique truncato ; cellula discoidali oclusa ; furcis apicalibus 1<sup>a</sup>, 2<sup>a</sup>, 3<sup>a</sup>, 4<sup>a</sup> et 5<sup>a</sup> instructæ ; posticæ anticis latitudine æquales, vix breviores ; cellula discoidali oclusa ; furcis apicalibus 1<sup>a</sup>, 2<sup>a</sup>, 3<sup>a</sup> et 5<sup>a</sup> instructæ. Pedes breves ; tibiis intermediis (♀) haud dilatatis.



Calcaria 2-4-4. Abdomen robustum; appendicibus inferioribus (♂) forcipatis, triarticulatis. (♂ et ♀.)

Antennæ longer than the wings, slender, obsoletely serrated within; basal joint very short. Head nearly quadrate above, the disk smooth and polished. Ocelli none. Maxillary palpi long and hairy; the basal joint short; the second and fourth equal; the third nearly twice the length of the second; the fifth very slender, thong-shaped, as long as the others united. Labial palpi small; the basal joint short; the second longer; the third very slender, much longer than the two others united. Prothorax rather distinct. Mesothorax subquadrate. Anterior wings narrow at the base, but broad at the apex; the apical margin obliquely truncated, and very slightly excised just below the apex; hairy clothing very slight, whence the wings appear smooth and polished; neuration strong and distinct; discoidal cell closed, rather large; a transverse vein below this cell, another closing the cellula thyridii, and two others towards the base; apical forks 1, 2, 3, 4 and 5 all present, forks 1 and 3 short. Posterior wings as broad as the anterior, and but slightly shorter; fringes very short; discoidal cell closed; apical forks 1, 2, 3 and 5 present. Legs rather short; the intermediate tibiæ not dilated in the female. Spurs 2-1-4; anterior tibiæ with two long and equal apical spurs; intermediate and posterior tibiæ each with two pairs of long and equal median and apical spurs. Abdomen robust; the apex obliquely truncated in the female; the male provided with pincer-like triarticulate inferior appendices.

This genus bears a certain amount of resemblance to *Hydropsyche*, but differs in the nearly-smooth and polished head and wings, in the obsoletely serrated antennæ, and in the form of the palpi, &c.

1. *Sciops unicolor*, n. sp. (Pl. XIX. fig. 7.)

S. antennis nigro-fuscis, ad medium ochraceis; capite polito, nigro; palpis nigro-fuscis; mesothorace nigro; alis anticis et posticis totis fuscis, nitidis, venis nigricantibus; pedibus et abdomine nigro-fuscis. (♀.)

Long. antenn. ?; corp.  $4\frac{1}{2}$  lin.; exp. alar. 13 lin.

Habitat ad Tondano in insula Celebes (Wallace).

In Mus. Saundersiano.

Antennæ bright fuscous, the middle portion bright ochreous. Head shining black. Eyes, palpi, legs and abdomen dull blackish-

fuscous. Mesothorax dull black. Wings totally shining-fuscous, with a purple reflexion in certain lights; the veins strong and blackish.

2. *Sciops octomaculata*, n. sp. (Pl. XVII. fig. 8.)

S. antennis flavo-ochraceis, ad basin et ad apicem obscurioribus; capite, thorace, abdomineque nigris; palpis ochraceofuscis; alis nigro-fuscis, nitidis, anticis albo-octomaculatis; pedibus fuscis, tarsi ochraceis; appendicibus superioribus parvis, inferioribus longis, forcipatis, triarticulatis, nigris; pene valde exserto. (♂.)

Long. antenn. ?; corp. 3 lin.; exp. alar.  $6\frac{1}{2}$  lin.

Habitat in insula Borneo (Wallace).

In Mus. Saundersiano.

Antennæ bright yellowish-ochreous, somewhat fuscous at the base and apex. Head shining black. Eyes blackish-fuscous. Palpi fuscous, somewhat ochreous. Mesothorax dull black. All the wings shining blackish-fuscous, with a purplish reflexion in certain lights; neuration scarcely darker; on the anterior wings there are about eight small whitish spots, regularly disposed. Legs fuscous; all the tarsi ochreous, the anterior tibiæ also somewhat ochreous. Abdomen dull black; superior appendices small; inferior appendices long, black, pincer-like, the tips approximating, triarticulate, the apical joint thinner; penis much exerted, and bent downwards.

Genus POLYCENTROPUS, Curtis.

1. *Polycentropus orientalis*, n. sp.

P. antennis et palpis pallide flavidis; capite thoraceque fuscis; alis anticis pallide griseo-fuscis, aureo-maculatis, margine costali longitudinaliter fusco-striato; alis posticis griseo-hyalinis, cellula discoidali aperta, costulis duabus primis non anastomosantibus; pedibus griseo-ochraceis; abdomine supra fusco, infra ochraceo; appendicibus superioribus parvis, plano-pyriformibus; inferioribus longioribus, subcylindricis, testaceis, ad apicem truncatis, nigricantibus. (Mas.)

Long. corp. 2 lin.; exp. alar.  $6\frac{1}{2}$  lin.

Habitat ad Macassar, in insula Celebes (Wallace).

In Mus. Saundersiano.

Antennæ and palpi pale yellowish. Head and thorax fuscous. Anterior wings pale greyish-fuscous, with golden yellow spots,

most conspicuous on the costa; costal margin with longitudinal streaks of dark fuscous; neuration slightly darker. Posterior wings hyaline, with a greyish tinge, iridescent. Legs greyish-ochreous. Abdomen fuscous above, ochreous beneath. In the male the superior appendices are small, flattened, pyriform, testaceous, and fringed with long hairs; inferior appendices longer, subcylindrical, testaceous, the apex truncated, with the corners rather produced and blackish.

The single example is not in good condition, the wings being much rubbed. In the neuration it agrees entirely with the group of *P. flavomaculatus*, Pictet (vide "The Entomologists' Monthly Magazine," vol. i., page 27; "Trichoptera Britannica," ante, p. 144), except that the two first costulæ do not anastomose in the middle.

#### Genus PSILOCHOREMA, nov. gen.

Antennæ graciles, alis vix longiores. Caput transversum, inter antennis productum. Ocelli valde conspicui. Palpi maxillares graciles; articulis duobus basalibus brevibus, latis; 3<sup>o</sup> elongato; 4<sup>o</sup> vix 3<sup>o</sup> breviori; 5<sup>o</sup> quam 3<sup>o</sup> longiori. Mesothorax ovatus, in ♂ penicillo medio instructus. Alæ anticæ in quiete fere planæ, angustæ, breviter et dense pilosæ; marginibus costali et dorsali fere parallelis; apice vix dilatato, obtuso; basin versus spatii nudis; cellula discoidali oclusa, (et in *P. mimico* cellula parva abnormali infra instructa); cellulis apicalibus longis, fere pariter angustis; furcis apicalibus 1<sup>a</sup>, 2<sup>a</sup>, 3<sup>a</sup>, 4<sup>a</sup> et 5<sup>a</sup> instructæ; alæ posticæ breviores, latiores; cellula discoidali aperta; furcis apicalibus 1<sup>a</sup>, 2<sup>a</sup>, 3<sup>a</sup> et 5<sup>a</sup> instructæ. Pedes modici. Calcaria 2-4-4. Abdomen modice robustum. (Mas et Fœm.)

Antennæ very slender, slightly longer than the wings; basal joint thick, shorter than the head. Head broadly transverse, produced in front between the antennæ, rugose, the hinder portion forming a kind of raised collar. Ocelli very distinct, round. Maxillary palpi slender, slightly hairy; the two basal joints short and broad; the third longer and slender; the fourth shorter than the third; the fifth thong-shaped, longer than the third. Labial palpi with a slender terminal joint. Mesothorax ovate, with a raised tuft of hairs in the middle, in the male. Anterior wings lying nearly flat when in repose, narrow, the margins nearly parallel; the apex somewhat dilated, obtuse and elliptical; hairy

clothing short and dense ; on the cubital veins, in the male, are tufts of raised hairs ; before the middle of the wing there are several cell-like spaces which are entirely glabrous ; neuration of the disk irregular ; discoidal cell closed (in *P. mimicum*), with an additional smaller cell placed below it, formed by the presence of a transverse vein between the two prongs of the lower fork of the ramus discoidalis) ; the apical veins long and parallel, forming long narrow apical cells ; apical forks 1, 2, 3, 4 and 5 all present. Posterior wings scarcely so long as the anterior and rather broader ; pubescence scanty ; fringes moderate ; neuration irregular ; forks 1, 2, 3 and 5 present. Legs moderately long, alike in both sexes. Spurs 2-4-4. Abdomen moderately robust.

This singular genus differs from anything with which I am acquainted, especially in the abnormal arrangement of the neuration, and in the position of the wings in repose ; in this latter condition the single species known to me bears a striking resemblance to a Micro-Lepidopterous insect of the genus *Depressaria*.

1. *Psilochorema mimicum*, n. sp. (Pl. XVIII. fig. 4.)

P. antennis fuscis, flavo-annulatis, ad apicem totis fuscis ; capite et thorace castaneis ; palpis brunneis ; alis anticis fuligineo-fuscis, aureo- et albo-signatis, fascia ante apicem indentata albida, basin versus penicillis pluribus nigricantibus ; alis posticis griseo-hyalinis ; pedibus griseo-ochraceis, tarsorum articulorum apicibus pallide flavo-annulatis ; abdomine nigricante-fusco ; appendicibus superioribus (♂) minimis, ad apicem clavatis, pilosis ; inferioribus maximis, latissimis, vix galeatis, intus concavis et dentibus parvis multis nigris, margine exteriore late emarginato. (♂ et ♀.)

Long. corp. 3 lin. ; exp. alar. 7½ lin.

Habitat in Nova Zeelandia.

In Mus. Brit.

Antennæ fuscous, annulated with yellow, the apical portion wholly fuscous. Head and mesothorax dark chestnut-brown. Palpi brown. Metathorax polished chestnut-brown. Anterior wings smoky-fuscous, with pale golden and whitish markings, most plentiful on the dorsal half ; a whitish indentated fascia a little before the apex ; several raised tufts of blackish hairs along the dorsal margin towards the base. Posterior wings greyish-hyaline. Legs greyish-ochreous, the tips of the tarsal joints an-

nulated with pale yellowish. Abdomen blackish-fuscous, the appendices testaceous. In the male the superior appendices are very small, slender at the base and clavate at the apex, hairy; inferior appendices very large and broad, concave, and furnished with numerous minute blackish teeth internally, the outer margin broadly emarginate; between the app. inf., on the superior portion, arises a long flattened and obtuse piece, which I regard as the upper penis-cover.

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*Observations on the Species of Trichoptera described by Mr. Walker, in Vol. V. of the 2nd Series of the Trans. Ent. Soc., pp. 176—180.*

*Phryganea divulsa.* The type is a female, not a male as is represented by Mr. Walker. It is very closely allied to *P. cinerea*, Walker, from Hudson's Bay, and perhaps identical therewith. Nevertheless the locality (Haiti\*) renders its distinctness possible, and one should see the male to be able to speak with certainty.

*Limnophilus griseus*, from Haiti, does not differ from the ordinary European form of that species. The specimen is a male, without abdomen.

*Leptocerus niveistigma*, *L. abjurans* and *L. quadrifurca*, have no resemblance to *Leptocerus* save the long antennæ and the narrow wings, and do not even belong to the *Leptoceridæ*. The neuration is identical with that of *Macronema*, and I consider them as forming a section of that genus characterized by the narrow and elongate anterior wings. In all three species the anterior tibiæ appear to be spurless, but the apex of the tibiæ is very obliquely truncated, and drawn out into a point, which might be mistaken for a spur, only that it is above, instead of below, the insertion of the first tarsal joint. The type of *L. quadrifurca* is a female, not a male as described.

\* I suppose always that the locality "Haiti" is correct; but both this insect and *Limnophilus griseus* are forms that one would scarcely expect to find within the tropics.

*Macronema percitans* is a good species of that genus, with possibly two very minute anterior spurs in the male.

Genus *Musarna*. This genus belongs to the *Sericostomidæ* and not to the *Leptoceridæ*. It is in part identical with *Barypenthus*, Burmeister, as has already been noticed by Hagen in his "Synopsis Synonymica." The single type of each of the three species is a male and not a female as described; by some error the words "*Mas et Fœm.*" and "*Male and Female*" are inserted at the head of the generic diagnosis and description. The three species are large and conspicuous insects, remarkable for their very broad wings, those of *M. claudens* being shorter than in the others; they bear considerable resemblance to each other, but according to recognized rules they must be placed in two genera. In all three the maxillary palpi of the males are ascending, the joints of nearly equal thickness and sparsely hairy; but in *M. aperiens* (Pl. XVIII. fig. 3) and *M. interclusa*, these palpi are four-jointed, whereas in *M. claudens* (Pl. XVIII. fig. 2) they are only three-jointed; the terminal joint in the first two species is small. The neuration of the wings is arranged in much the same manner in all three, but again there is a striking difference, for in *M. aperiens* and *M. interclusa* there is one more apical cell in both pairs of wings than in *M. claudens*, the lower branch of the ramus thyriifer in the anterior wings being bifurcate in the two former and simply furcate in the latter, with a corresponding difference in the forks of the posterior wings.\*

*M. claudens* (Pl. XVIII. fig. 2) is identical with *Barypenthus rufipes*, of Burmeister (Handb. Ent. ii. p. 929, 2); the diagnosis of the latter is short and unsatisfactory, but the figure by Kolenati (Gen. et Spec. Trichop. pt. 2, tab. iv. fig. 48) leaves no doubt on the subject. It seems probable, however, that Burmeister, and it is certain that Kolenati, included one of the other species of *Musarna* of Walker under the generic term *Barypenthus*, for I think that *B. concolor* of Burmeister is identical with *M. aperiens* of Walker; and Kolenati, in his description of the genus *Barypenthus*, says that the maxillary palpi are four-jointed, although Burmeister in his generic description states that the maxillary palpi of the males are distinctly three-jointed; this agrees with *B. rufipes*, which must therefore be considered as the type of the genus.

\* In the type of *M. aperiens* the sixth apical cell in the right anterior wing is divided by a transverse vein, placed not far from the base of the cell; this is wanting in the left wing, and is simply an aberrant variation. This vein is indicated by a dotted line in Plate XVIII. fig. 3.

The two genera, *Barypenthus* and *Musarna*, may therefore be advantageously retained; *M. claudens* being transferred to *Barypenthus*, as identical with *B. ruficeps*, and *M. aperiens* and *M. interclusa* remaining under *Musarna*, the former, however, being probably identical with *B. concolor*. *M. interclusa* appears to be distinct from *M. aperiens* from its universally darker colour, of which even the legs and the underside of the abdomen partake.

Genus *Curgia*. This is possibly a good new genus, but the type of *C. braconoides* bears extreme resemblance to *Chimarra*. The description is very faulty. The second joint of the maxillary palpi does not present "a spine at its tip," as mentioned by Mr. Walker; but at that spot there is a tuft of long bristle-like hairs, quite analogous to what is found in *Chimarra marginata*. In the diagnosis we find the words "tibiæ posteriores calcaribus duobus longis apicalibus," and lower down, "tibiæ posticæ calcaribus duobus mediis;" similarly in the description we find the words "posterior tibiæ with two long apical spurs," and lower down "hind tibiæ with two middle spurs;" the natural supposition is that the words "posteriores" and "posterior" were written by mistake for "anteriores" and "anterior," and this view Dr. Hagen appears to have taken, and has thereby been misled into describing the spurs, in his "Synopsis Synonymica," as 2-3-4. In reality the anterior tibiæ are without spurs, and the intermediate tibiæ have four spurs, instead of three. It is true that in the type-specimen, one of the median spurs is broken off from one of the intermediate tibiæ, and on the other one spur is closely pressed against the tibia itself, and is difficult to see; but there it is, without doubt, and as long as the others. Hence the spurs of *Curgia* (♀) are 0-4-4. The neurulation is very similar to that of *Chimarra marginata*, but the cell-like spaces on the disk of the wing of that genus are not represented in *Curgia*; the apical veins are quite the same. I am not sure that *Chimarra* possesses a closed discoidal cell in the anterior wings, which is the case in *Curgia*, although here the transverse veins are transparent, and not seen well, except from the underside. The type is a female.

I repeat that *Curgia* and *Chimarra* are very closely allied, and it is possible that if the former be really distinct, some (or all) of the described exotic species of the latter should be transferred to it.

No locality is mentioned for *Curgia braconoides*; the type is labelled "St. Domingo."

## EXPLANATION OF THE PLATES.

## PLATE XVII.

- Fig. 1. *Phryganea Maclachlani*, ♀.  
 ,, 2. *Asotocerus ochraceellus*, ♂ ?.  
 ,, 3. *Macronema Saundersii*, ♂.  
 ,, 4. *Macronema Wallacei*, ♀.  
 ,, 5. *Stenopsyche griseipennis*, ♂.  
 ,, 6. *Nesopsyche flavisignata*, ♀; 6<sup>a</sup> posterior leg.  
 ,, 7. *Hydropsyche Edwardsii*, ♂.  
 ,, 8. *Sciops octomaculata*, ♂.

## PLATE XVIII.

- Fig. 1. Neuration of *Pycnocentria funerea*, ♂; 1<sup>a</sup> head and palpi, 1<sup>b</sup> posterior leg, 1<sup>c</sup> anal appendices (above), 1<sup>d</sup> ditto (side), 1<sup>e</sup> neuration of ♀, 1<sup>f</sup> maxillary palpus of ♀.  
 ,, 2. Neuration of *Barypenthus rufipes*, ♂; 2<sup>a</sup> maxillary palpus, 2<sup>b</sup> labial palpus, 2<sup>d</sup> anal appendices (above), 2<sup>e</sup> ditto (side).  
 ,, 3. Neuration of *Musarna aperiens*, ♂; 3<sup>a</sup> maxillary palpus, 3<sup>b</sup> anal appendices (above), 3<sup>c</sup> ditto (side).  
 ,, 4. Neuration of apical portion of anterior wing, and of the whole of the posterior wing of *Psilochorema mimicum*; 4<sup>a</sup> maxillary palpus, 4<sup>b</sup> anal appendices of ♂ (side), 4<sup>c</sup> ditto of ♀ (side).

## PLATE XIX.

- Fig. 1. Neuration of *Ganonema pallicorne*, ♀; 1<sup>a</sup> maxillary palpus, 1<sup>b</sup> anal appendices (above), 1<sup>c</sup> ditto (beneath).  
 ,, 2. Neuration of *Asotocerus ochraceellus*; 2<sup>a</sup> maxillary palpus.  
 ,, 3. Neuration of *Notanatotica magna*, ♀; 3<sup>a</sup> maxillary palpus, 3<sup>b</sup> anal appendices (above), 3<sup>c</sup> neuration of apical portion of anterior wings of ♂, 3<sup>d</sup> anal appendices (above), 3<sup>e</sup> ditto (side).  
 ,, 4. Neuration of *Macronema Saundersii*; 4<sup>a</sup> anal appendices, ♂ (side).  
 ,, 5. Neuration of *Stenopsyche griseipennis*, ♂; 5<sup>a</sup> maxillary palpus, 5<sup>b</sup> labial palpus, 5<sup>c</sup> anal appendices (above), 5<sup>d</sup> ditto (side), 5<sup>e</sup> ditto (beneath).  
 ,, 6. Neuration of *Nesopsyche flavisignata*, ♀; 6<sup>a</sup> maxillary palpus, 6<sup>b</sup> labial palpus.  
 ,, 7. Neuration of *Sciops unicolor*, ♀; 7<sup>a</sup> maxillary palpus, 7<sup>b</sup> labial palpus.  
 ,, 8. Neuration of *Leptopsyche gracilis*, ♂; 8<sup>a</sup> maxillary palpus, 8<sup>b</sup> anal appendices.